

L'exemplaire filmé fut reproduit grâce à la
générosité de:

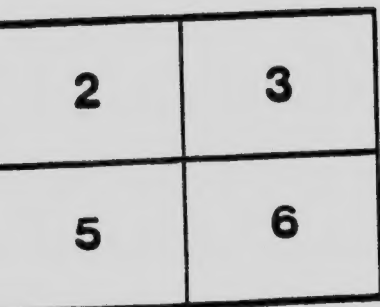
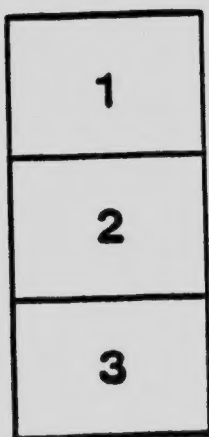
Bibliothèque nationale du Canada

Les images suivantes ont été reproduites avec le
plus grand soin, compte tenu de la condition et
de la netteté de l'exemplaire filmé, et en
conformité avec les conditions du contrat de
filimage.

Les exemplaires originaux dont la couverture en
papier est imprimée sont filmés en commençant
par le premier plat et en terminant soit par la
dernière page qui comporte une empreinte
d'impression ou d'illustration, soit par le second
plat, selon le cas. Tous les autres exemplaires
originaux sont filmés en commençant par la
première page qui comporte une empreinte
d'impression ou d'illustration et en terminant par
la dernière page qui comporte une telle
empreinte.

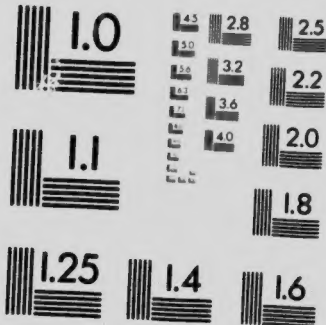
Un des symboles suivants apparaîtra sur la
dernière image de chaque microfiche, selon le
cas: le symbole ➡ signifie "A SUIVRE", le
symbole ▼ signifie "FIN".

Les cartes, planches, tableaux, etc., peuvent être
filmés à des taux de réduction différents.
Lorsque le document est trop grand pour être
reproduit en un seul cliché, il est filmé à partir
de l'angle supérieur gauche, de gauche à droite,
et de haut en bas, en prenant le nombre
d'images nécessaire. Les diagrammes suivants
illustrent la méthode.



MICROCOPY RESOLUTION TEST CHART

(ANSI and ISO TEST CHART No. 2)



APPLIED IMAGE Inc

1653 East Main Street
Rochester, New York 14609 USA
(716) 482-0300 - Phone
(716) 288-5989 - Fax

DUPLICATE
J.E.C.

PROVINCE OF BRITISH COLUMBIA.

DEPARTMENT OF AGRICULTURE (LIVE STOCK BRANCH).

4 ROOT-SEED GROWING.

BY WM. NEWTON, SOIL AND CROP INSTRUCTOR.



THE Province of British Columbia is dependent upon outside sources for root-seed at the present time. At no time is it wise for any province or country to depend upon outside sources for any commodity that can be profitably produced at home. This has been forcibly brought to our attention by the danger of our European supply being entirely or partially cut off. We need not be dependent upon Europe for our supply of root-seed, for all indications would suggest that there are numerous districts in British Columbia where root-seed production bids fair to become a profitable agricultural industry.

Our present standard of commercial root-seed is too low, both from the standpoint of the vitality of the seed and from the standpoint of type or variety. Our seedsmen are only partially to blame, for they have had to depend too largely on a foreign market for their supply. The favourable conditions for seed production in many parts of this Province would indicate that seed of excellent quality will be obtained if proper methods are followed.

SELECTION OF SOIL.

For the successful production of root-seed, deep, well-managed soils are recommended, rich in humus and high in fertility. Drainage is also very essential, for seed-roots must not have wet feet. Richness is absolutely essential. For this reason heavy applications of farmyard manure are necessary. Liquid manure for seed-roots is particularly desirable. Too often this valuable fertilizer is allowed to run away in the gutters instead of it being applied to the land. If farmyard manure is not available and commercial fertilizers have to be used, the nitrogen should be applied as sulphate of ammonia, rather than nitrate of soda, for the latter tends to cause too rapid a growth, with the result that the stalks are weak and are liable to be broken off or injured by the wind.

WIND-BREAKS.

Better results are obtained when the seed-plants are protected from the full force of the wind. Where some protection is given, either by trees, buildings, or even a few rows of corn grown alongside, not only will the danger of branches breaking off be lessened, but the vitality of the seed will be greater if some protection is given.

CHOICE OF KIND.

It is usually advisable to grow the seed of that kind of root, whether it be mangel, swedes, carrots, or turnips, that you are growing and find most suitable to your particular conditions. However, it must be remembered that the young mangel shoots are more susceptible to frosts in the spring than swedes, and as the mangel-



seed ripens comparatively late, it is more liable to become frost-bitten in the fall. For this reason, in districts where early and late frosts are liable to occur, the growing of this kind of root-seed may prove too hazardous. Carrot-seed ripens very unevenly and has to be picked by hand over a period of several weeks. This means that the production of carrot-seed is liable to prove expensive except for home use unless cheap labour is available.

SELECTION OF ROOTS.

In the selection of roots to be used in seed production the grower must have a clear conception of the type he intends to breed. Having satisfied himself on an ideal type, it naturally follows that the roots selected will be free from disease and as close to perfection as can be obtained. Smooth healthy roots with neat crowns and free from prongs or irregularities are desirable.

LARGE OR MEDIUM-SIZED ROOTS.

Many people believe that the largest roots should be selected. They are of the opinion that the large amount of nourishment contained in the bigger roots will mean more seed and seed of a better quality. This, however, is a misconception.



A sunflower ridge to prevent cross-fertilization in a mangrove field.

Practical growers and experimenters agree that medium-sized roots produce seed equal both in quality and quantity with seed from large roots. This being true, there are many reasons why the smaller roots should be used. Smaller roots keep better. When the roots have to be stored for a long period, and where storing facilities are not the best, the importance of this character in smaller roots is outstanding. Again, smaller roots require less storage and are more easily handled. This is especially true when you come to planting, for all roots have to be covered well, whether large or medium-sized roots are used.

USE OF IMMATURE ROOTS (STECKLINGS).

Root-seed is sometimes grown from small, not quite developed roots, rather than mature medium-sized roots. If such a practice is followed, it must be borne in mind that the medium-sized roots are more easily judged for type, uniformity, and other general characters than the immature small roots known as "stecklings." Small roots usually appear smooth and of good quality to the eye of an unexperienced man. Therefore, until a grower has had a little experience it will be wise

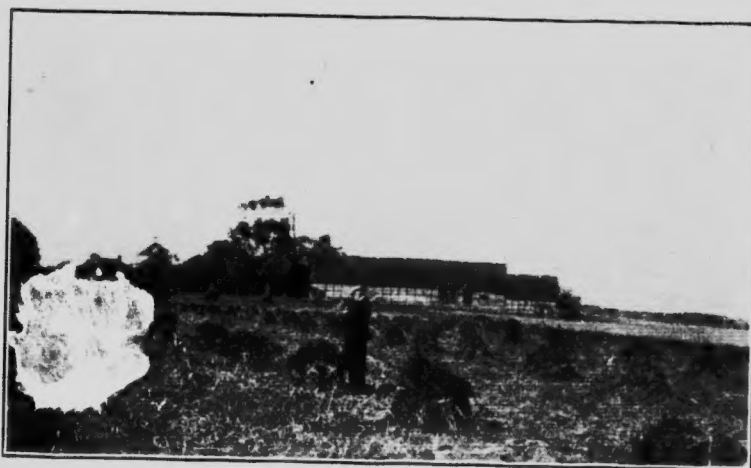
for him to stick to medium-sized roots. When stecklings are used, they must come from seed of choice, fully developed mother roots belonging to a pure strain, otherwise the constant use of these small roots during successive generations would result in a poor strain.

TRIMMING SEED-ROOTS.

Seed-roots should not be harvested like ordinary roots. They should be harvested in such a way as to make a vigorous start immediately on being planted out in the spring. The root systems of the seed-roots must be left as intact as possible if this rapid start is to be made. The seed-bearing stalks come from the crown, consequently care must be taken that the crown remains uninjured. It is recommended that the tops be cut off about 3 to 4 inches above the crown. Twisting the tops off may be a labour-saving method, but enough injury will result from such a practice to injure the roots for seed production. If the crowns are mutilated in any way they will tend to produce numerous sprouts rather than a single seed-stalk. This is undesirable, for the best-quality seed comes from seed-plants with a single main stalk.

STORING.

In order to bring your seed-roots through the winter successfully the different methods of storing must be studied carefully. The roots must be stored in such a way that they will be uninjured by frosts or by heating. The sooner the roots are stored in a cool—not too dry—place after pulling, the better. When a good root-cellar is at hand, it is advisable to store there if possible in a standing position and surrounded with peat soil or moist sand. Good ventilation should be provided for,



Stooks of mangel seed stalks.

and the temperature must be kept as low as possible, providing it does not reach freezing-point. The critical period is during the spring, when a cellar is apt to be put to its severest test. As soon as the mild weather sets in there is the danger of heating and decay commencing.

It is probable that under ordinary conditions better results will be obtained by storing in pits outside. The main essential is to have the pit on well-drained land. The pit should be made about 6 feet wide and about 3 feet high, with slanting sides. After filling, the pit should be covered with a layer of straw, and this should be covered with a layer of earth. The top of the pit is left without any soil until the cold weather sets in, so that the heat can escape. Unless weather conditions are very severe, it is usually advisable to leave small openings throughout the winter for

ventilation. The openings can be well covered with straw. In regard to the thickness of the covering, this must be regulated according to climatic influences. In the spring it is very often advisable to shovel off part of the earth, for heating is liable to result if the covering is too thick.

PLANTING.

Roots of all kind cross-fertilize very readily. It is therefore never advisable to grow related root-plants together. Mangels and sugar-beets cross very readily; similarly, turnips with swedes. What is true of related kinds of roots, such as mangels and sugar-beets, is more true in regard to the different varieties of the same kind. You will find that the different varieties of mangels will cross more readily between themselves than with sugar-beets or other more distantly related plants. Unless protected by trees, buildings, or in some other way, it is not safe to grow another variety or kind of root-seed at less than 100 to 250 yards away.

After the land is well prepared it should be marked. The common distances for medium-sized roots are 30 x 30 inches. If small roots (stecklings) are used, 24 x 24 inches will be satisfactory.

In planting out seed-roots, bury the roots completely. The shoulders of the roots should be covered by $\frac{1}{2}$ inch of soil. When the soil is too shallow, incline the root. Do not allow the roots to dry out. Plant the roots as soon as they are removed from the cellar or pit, and if possible choose a dull day for planting.



Stooks of mangel-seed stalks.

CULTIVATION.

Not only should the land be comparatively free from weeds before root-growing is attempted, but every precaution should be taken to keep the cultivator going during the early part of the season, for the plants close in very rapidly, making further cultivation impossible. In order to preserve the moisture in the soil and keep down the weeds, the use of the hand-cultivator is recommended after the length of the seed-stalks prevent the use of the horse-cultivator.

HARVESTING AND THRESHING.

Considerable judgment has to be used in choosing the most advantageous time to begin harvesting. The lower parts of the seed-stalks ripen earlier than the rest, and inasmuch as this seed is stronger than the rest, harvesting should be commenced before the seed from the lower part begins to fall off.

With mangels, when the brown seed clusters are cut with a knife and show a scaly surface it is time to harvest. With swede-seed, begin to harvest when the lower pods are getting brown on the outside and the upper ones have attained a yellowish colour. Under commercial conditions it will be necessary to cut the seed-stalks, tie in loose sheaves, and leave in open stacks until dry enough to draw to the barn. Here they should be threshed as soon as possible with an ordinary grain-threshing mill. The seed is cleaned with a fanning-mill and sieves. It must be then spread out in thin layers and shuffled daily until quite dry.

PROFITS IN ROOT-SEED GROWING.

The following figures were submitted to us by Professor W. A. Taylor, Chief of the Bureau of Plant Industry, U.S.A. The cost of growing, harvesting, and fitting for market, not including the rent of land, manure, etc., would be as follows:—

	Cost of Growing.	Yield.
Turnip	1½ to 3 cents per lb.	1,000 to 4,000 lb. per acre.
Beet	2 to 4 "	1,000 to 3,000 "
Carrot	3 to 6 "	800 to 2,000 "

To be successful, the root-seed grower must study not only cultural conditions, but he must also study types of roots, for if he selects good roots the standard of root-seed is going to be raised very materially in this Province. Under favourable conditions, root-seed production on a commercial scale will be profitable. However, the average person will be wise to plant out enough roots to supply his own needs at least. By so doing the tendency will be to produce a strain particularly adapted to his own needs.

VICTORIA, B.C.:

Printed by WILLIAM H. CULLIN, Printer to the King's Most Excellent Majesty.
1915.



